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CENTRAL INTELLIGENCE AGENCY

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12 October 1949

INTELLIGENCE MEMORANDUM NO. 237

SUBJECT: Capabilities of the USSR in Air-to-Air Guided Missiles and Related Proximity Fuses

Part I. 1 May 1950

It is just possible that reproductions of German air-to-air missiles might be ready in limited quantities (less than one hundred) for operational use by the Soviets in 1950. These missiles would be relatively ineffective against a heavily armed bomber of the B-36 type. It is also possible that a relatively crude proximity fuze might be used since such a fuse need not utilize miniature or ruggedized vacuum tubes. See Appendix A for a summary of intelligence data.

Part II. 1 May 1953 and 1 May 1956

Assuming that Soviet scientists engaged in the development of an air-to-air guided missile are the equal of scientists in America and assuming further that they have the benefit of espionage directed against U.S. efforts, it is believed that a Soviet-developed, supersonic, air-to-air guided missile might be ready by 1955. See Appendix A.

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APPENDIX A

Substance of Intelligence on Air-to-Air Guided Missiles and Proximity Fuses for Them

Except for the comments of one moderately well-placed source, we have no data on Soviet development of air-to-air guided missiles. This source does not know whether or not any of the German projects are being followed up, but he thinks it more than likely, since the Soviets have always been interested in rockets for air-to-air combat.

Two air-to-air missiles were under development by the Germans at the end of World War II. One of these, the X-4, was to be carried aloft and launched from the FW 190 and Me262 aircraft. Development tests of this missile appeared successful, but the missile was never used operationally because of the inherent danger in the liquid-fuel propellant system. A power rocket unit was under development for a safer and more practical propulsion system.

The X-4 had an approximate maximum speed of 820 feet/second and a maximum Mach number of 0.795. The missile was remotely controlled by electrical impulses transmitted along a pair of fine insulated wires connecting it with the parent aircraft. The sense of the signals transmitted and hence the direction the missile travelled was determined by the motion of a joystick operated by the pilot of the parent aircraft. The maximum distance at which the missile could be operated was approximately 3-3/4 miles.

Information on stability and position of the missile in flight was obtained visually by means of a reflector-type aiming device. The operator was assisted in his guidance by means of candle flares carried

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on the missile. During the period of guidance, it is believed that the launching aircraft would be very susceptible to fighter attack. Harassing tactics by opposing aircraft would be sufficient to disturb the aim of the pilot.

The other air-to-air missile under development was the Hs-298, which was designed for use against enemy bombers. It was carried underneath the wing and fuselage of fast bombers or fighters equipped with special launching rails. The German government placed high priority on the development of the Hs-298. By early 1945 it was being mass produced. Production was discontinued in February of the same year, however, probably because of the discovery of the vulnerability of the parent planes to attacks by fighters. Test flights were carried out with three missiles. Two missiles were successfully launched, but one exploded prematurely and the other nose-dived and crashed. The third stuck on the launching rail. We have no data on completely successful flights. The missile was never used operationally. It was anticipated that the missile could attack a target flying without evasive action at a slant range of 5,000 yards. The missile was to be capable of attacking a target 1,000 yards above the point of release. Targets always had to be attacked visually within a limited field. The approximate maximum speed of the Hs-298 was 790 feet/second, and it had a maximum Mach number of 0.72. Its maximum range was about 5,000 yards.

The guidance system was to be similar to that of the X-4 except that at first a radio link instead of a wire link was planned. Since such a radio link was susceptible to jamming, a wire link was developed. We do not believe any flights were made using this method of control.

Two crew members of the parent aircraft were required to operate the

aiming system. One sighted on the target with an aiming device, and the other guided the missile by looking through a telescope and operating a joystick. The pilot had to maneuver the parent aircraft so as to keep the target ahead and to starboard, since the aiming device was mounted on the starboard side.

It was planned to use proximity fuses with both the X-4 and Hs-298 but none was available by the end of the war.